DIPLOMA PROGRAMME IN

ELECTRONICS AND COMMUNICATION ENGINEERING

(For the State of Haryana)

1. SALIENT FEATURES OF THE PROGRAMME

1.	Name of the Programme	:	Diploma Programme in **Electronics and Communication Engineering**
2.	Duration of the Programme	:	Three years (6 semester)
3.	Entry Qualification	:	Matriculation or equivalent as prescribed by State Board of Technical Education, Haryana
4.	Intake	:	40
5.	Pattern of the Programme	:	Semester Pattern
6.	Ratio between theory and Practical	:	50 : 50(Approx)

2. EMPLOYMENT OPPORTUNITIES AND ACTIVITY PROFILE OF DIPLOMA HOLDERS IN ELECTRONICS AND COMMUNICATION ENGINEERING

An exercise, to have first hand information about employment opportunities and activity profile of diploma engineers in the field of electronics, was done by Curriculum Development Centre of National Institute of Technical Teachers' Training and Research, Chandigarh. The feedback from industries and other organizations has revealed that diploma holders in Electronics and Communication Engineering find employment in the following organizations:

Employment Opportunities

Various Departments/ organizations/boards and corporations

1) Tele-Communication Engineering and related Departments
2) AIR, Doordarshan,
3) Overseas Communication,
4) Mine Communication,
5) Radar and Wireless,
6) Railways,
7) Defence Services,
8) Electricity Boards and Corporations etc.

Industry

9) Communication Industry Including Paramilitary Services
10) PCB Design and Fabrication Industry
11) Process Control Industry
12) Consumer Electronics Industry
13) Electronic Components and Devices Manufacturing and Installation Organizations
14) Computer Assembling and Computer Peripheral Industry;
15) Computer Software Areas for Electronic Design and Semi Conductor Manufacturing Industry
16) Automobile Industry
17) Medical Electronics Industry
18) Instrumentation and Control Industries

Development/Testing Laboratories/Organizations

19) Electronics Service Centres
20) Opto Electronics
21) Computer Networking
22) Hospitals
23) Educational Institutions
24) Sales and Services of Electronic Gadgets from Small Scale Industries

Self Employment

- Marketing and Sales (Distributors - whole sale and retailers)
- Service Sector(repair and Maintenance; job work)
- Cable laying and jointing DBs etc.
- Preparing Simulated Models

Activity Profile

The diploma holders in Electronics and Communication Engineering (ECE) generally get employed in manufacturing, assembly industries of consumer electronics, process control and instrumentation, Doordashan and All India Radio (AIR), defence organizations, marketing and servicing organizations. The activities they perform are listed below:

1) Reading, interpreting and preparing drawings and circuits in electronics and related fields
2) Preparing estimates of men and material required for different jobs of installation and maintenance
3) Making/preparing and interpreting layout of printed circuit boards and chassis
4) Selecting instrument and devices for simple applications
5) Testing the materials used in assembly work.
6) Supervising the fabrication and assembly work at sub-assembly and final assembly
7) Assisting the engineer in quality control of the product being assembled or manufactured

8) Operating, recording and display equipment in AIR/Doordarshan stations and studios

9) Operating, testing and maintenance of the communication receiver and transmitter in AIR/ Doordarshan/Overseas communication sections

10) Operation, testing and maintenance of the control room equipment in AIR/Doordarshan, power plant and process industry

11) Operates tests and maintains the telephone exchanges in Tele-communication department

12) Installation of the PBX or PABX exchanges/telex for organizations including Tele-communication department and post and telegraph department

13) Supervision of the fabrication and assembly work of trans-receivers and walkie-talkie used for police wireless, mines communication and defence services

14) Operation, testing and maintenance of radar equipment used in defence services

15) Assistance to the engineers/scientist doing research/development work by fabricating and testing different electronic circuits

16) Operates, maintains and tests computer and computer peripheral equipment

17) Supervising the assembly and testing work in computer industry

18) Maintenance and repairing of medical electronic equipment in hospitals and supervises fabrication and production of medical electronics equipment like ECG, EEG, blood pressure monitor unit, X-ray units etc

19) As a self employed person he has to use multifarious activities such as designing PCBs, procuring raw material and components, assemble, manufacture, repair and maintenance, testing and fault diagnosis, sale and service, marketing etc.

3. COMPETENCY PROFILE OF DIPLOMA HOLDERS IN ELECTRONICS AND COMMUNICATION ENGINEERING

Keeping in view the job opportunities, activity profile and various domains of learning, the diploma holders in Electronics and Communication Engineering should have following competency profile in terms of knowledge and skills in the students:

1) Skills in reading and interpreting drawings pertaining to electronic circuits, instruments, and equipment

2) Understanding of basic principles of electrical and electronics engineering

3) Understanding of electrical machines and equipment

4) Understanding of basic principles of digital electronics; communication engineering and systems; audio video systems and industrial electronics

5) Knowledge of different electronic devices, components, materials and instruments used in manufacturing and testing of electronic products

6) Skills in fabrication and testing of different types of electronic circuits and devices by making use of testing and measuring instruments

7) Skills in fabrication of PCBs and designing the layout of various instruments, chassis and equipment for wiring/circuit development

8) Knowledge of installation and maintenance of

   - Electronic telephone exchanges
   - Communication systems
   - Computer systems

9) Competency in solving simple problems related to various functional areas of electronics engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment pertaining to:

   - Electronic measuring instruments
   - Electronic consumer goods
   - Entertainment equipment (Audio/video system)
   - Communication systems

10) Knowledge and skills pertaining to installation and maintenance of industrial electronics equipment and system and process control instrumentation

11) Knowledge and skills in using information technology tools for information storage, retrieval and dissemination, and making use of computer application software

12) Knowledge of programming for software development

13) Knowledge of microprocessors and their applications in electronic system

14) Understanding of various relevant standards for testing and quality control in electronics

15) Knowledge of basic principles of management and entrepreneurship to manage men, material and machines optimally and efficiently, awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques

16) Knowledge of applied and engineering sciences for better comprehension of technologies used in electronics and related industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education

17) Proficiency in oral and written communication, technical report writing, managing relationship with juniors, pears and seniors for effective functioning in the world of work

4. CURRICULUM AREAS DERIVED FROM COMPETENCY PROFILE

Following curriculum areas have been derived from competency profile as identified in Section 3:

Sr. No.	Competency Profile	Curriculum Area/Subjects
1.	Skills in reading and interpreting drawings pertaining to electronic circuits, instruments and equipment	- Engineering Drawing - Electronic Devices and Circuits
2.	Understanding of basic principles of electrical and Electronics Engineering,	- Basic Electrical Engineering - Analog Electronics
3.	Understanding of electrical equipment and machines	- Electrical Machines - Electronic Devices and Circuits
4.	Understanding of basic principles of digital electronics; communication engineering and systems; audio video systems and industrial electronics	- Digital Electronics - Audio Video Systems - Principles of Communication Engineering
5.	Knowledge of different electronic devices, components, materials and instruments used in manufacturing and testing of electronic products	- Electronic Components and Materials - Electronic Measurement and Instrumentation
6.	Skills in fabrication and testing of different types of electronic circuits and devices by making use of testing and measuring instruments	- Electronic Fabrication - Electronic Measurement and Instrumentation - Electronic Circuits and Devices
7.	Skills in fabrication of PCBs and designing the layout of various instruments, chassis and equipment for wiring/circuit development	- PCB Design and Electronic Fabrication - Electronic Workshop
8.	Knowledge of installation and maintenance of - Electronic telephone exchanges - Communication systems - Computer systems	- Fault Diagnosis and Trouble Shooting and mtce of Electronic Communication Systems - Consumer Electronics - Computer Applications

Sr. No.	Competency Profile	Curriculum Area/Subjects
9.	Competency in solving simple problems related to various functional areas of electronics engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment pertaining to: Electronic measuring instruments	- Fault Diagnosis and Trouble Shooting of Electronic Consumer Goods and equipment - Consumer Electronics - Communication Engineering
	- Electronic consumer goods - Entertainment equipment (Audio/video system) - Communication systems	
10.	Knowledge and skills pertaining to installation and maintenance of industrial electronics equipment and system and process control instrumentation	- Power Electronics - Electrical Machines - Micro Controllers and PLCs
11.	Knowledge and skills in using information technology tools for information storage, retrieval and dissemination, and making use of computer application software	- Computer Fundamentals - Basics of Information Technology
12.	Knowledge of programming for software development	- Computer Programming and Applications
13.	Knowledge of microprocessors and their applications in electronic system	- Microprocessors and Applications - Advanced Microprocessors
14.	Understanding of various relevant standards for testing and quality control in electronics	- Fault Diagnosis and Trouble Shooting
15.	Knowledge of basic principles of management and entrepreneurship to manage men, material and machines optimally and efficiently, awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques	- Entrepreneurship Development and Management
16.	knowledge of applied and engineering sciences for better comprehension of technologies used in electronics and related industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education	- Applied Physics - Applied Mathematics - Applied Chemistry - Engineering Drawing - Workshop Practice

Sr. No.	Competency Profile	Curriculum Area/Subjects
17.	Proficiency in oral and written communication, technical report writing, managing relationship with juniors, pears and seniors for effective functioning in the world of work	- Communication Skills - Project Work

5. ABSTRACT OF CURRICULUM AREAS/ SUBJECTS

The subjects have been divided in four different categories:

1. Basic Sciences

(1) Communication Skills - 1 & II

(2) Entrepreneurship Development and Management

2. Applied Sciences

(1) Applied Physics - I & II

(2) Applied Chemistry - I & II

(3) Applied Mathematics - I and II

3. Basic Courses in Engineering/ Technology

(4) Engineering Drawing

(5) General Workshop Practice - I & II

(6) Basics of Information Technology

4. Area Specific Engineering/ Technology Subjects

(7) Basic Electrical Engineering

(8) Analog Electronics I & II

(9) Electronic Components and Materials

(10) Digital Electronics I & II

(11) Principles of Communication Engineering

(12) Electrical Machines

(13) Electronic Drawing, Design and Fabrication Technology

(14) Computer Programming and Applications

(15) Microprocessors and Applications

(16) Network, Filters and Transmission Lines

(17) Electronic Instruments and Measurement

(18) Power Electronics

(19) Medical Electronics

(20) Digital and Data Communication

(21) Instrumentation

(22) Consumer Electronics

(23) Trouble Shooting of Electronic Equipment

(24) Major Project Work

5 Specialised Courses in Engineering/ Technology

Elective-I, to choose any one from the following:

(25) Optical Fibre Communication

(26) Advanced Microprocessors

Elective-II, to choose any one from the following:

(27) Microcontrollers and PLCs

(28) Computer Organisation and Architecture

In addition,

Ecology and Environmental Awareness Camp will be organized in First Year and Entrepreneurial Awareness Camp will be organized in Second Year .

6. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subjects	Distribution in Hours per week in Various Semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	5	5	-	-	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	6	5	-	-	-	-
4.	Applied Chemistry	4	4				
5.	Basic Electrical Engineering	-	5	-	-	-	-
6.	Basics of Information Technology	4	-	-	-	-	-
7.	Engineering Drawing	6	-	-	-	-	-
8.	General Workshop Practice	6	6	-	-	-	-
9.	Electronic Components and Materials(ECM)	-	-	4	-	-	-
10.	Analog Electronics	-	6	7	-	-	-
11.	Principle of communication Engineering	-	-	6	-	-	-
12.	Digital Electronics	-	-	7	6	-	-
13.	Electrical Machines	-	-	6	-	-	-
14.	Electronic Instruments and Measurement	-	-	7	-	-	-
15.	Network, Filters and Transmission Lines	-	-	-	7	-	-
16.	Communication Engineering-I	-	-	-	7	-	-
17.	Computer Programming and Applications	-	-	-	6	-	-
18.	Microprocessors and Applications	-	-	-	7	-	-
19.	Minor Project Work	-	-	-	3	-	-
20.	Consumer Electronics	-	-	-	-	6	-
21.	Maintenance of Computer Systems (MOCS)	-	-	-	-	6	-
22.	Trouble Shooting of Electronic Equipments	-	-	-	-	6	-
23.	Communication Engineering-II	-	-	-	-	6	-
24.	Elective-I	-	-	-	-	6	-
25.	Power Electronics	-	-	-	-	6	-
26.	Medical Electronics	-	-	-	-	-	4
27.	Instrumentation	-	-	-	-	-	7
28.	Digital and Data Communication	-	-	-	-	-	8
29.	Elective-II	-	-	-	-	-	4
30.	Entrepreneurship Development and Management	-	-	-	-	-	3
31.	Major Project Work	-	-	-	-	-	10
32.	Student Centred Activities	4	4	3	4	4	4
	Total	**40**	**40**	**40**	**40**	**40**	**40**